

REMARKS

This paper is responsive to the Office Action dated June 2nd, 2008 wherein claims 1-23 were rejected as per page 2 of the office action. However, there are no rejections mentioned against claims 15-22 in the text of the Office Action. Hence the Applicants assume that claims 15 - 22 constitute allowed subject matter. Thus only claims 1-14 and 23 are rejected. By this paper, Applicants amend claims 1, 6, 8, and 15 for better illustration of the features and cancel claim 23. After the amendment, claims 1-22 remain pending in this application. In view of the following remarks, Applicants request further examination and reconsideration of the present patent application.

Amendment to claims

Claims 1 and 15 have been amended to include the phrase - "partially combusting."

Both of these claims have been amended to include aspects of partial combustion. Paragraph 22 recites *inter alia*, "The combustion products comprise carbon dioxide, carbon monoxide, **uncombusted hydrocarbon**, steam, hydrogen and the inert components of air in the feed stream, such as, nitrogen", emphasis added. Clearly, the combustion process is not 100% complete and because of which, the uncombusted hydrocarbons appear in the combustion products. Thus the amendments do not add any new subject matter.

Claim 6 has been amended to correct the antecedent basis for "cyclical compression chamber" and claim 8 has been amended to reflect amendments in claim 1 discussed above.

Thus, the Applicants assert that the amendments do not add any new subject matter.

Rejections under 35 USC §112

The Applicants respectfully note the rejection of claim 6 under 35 USC 112, second paragraph, as failing to meet the definiteness requirement due to lack of antecedent basis. Claim 6 as been amended to modify "the cyclical compression chamber" to "a cyclical compression chamber." Accordingly, the Applicants respectfully request withdrawal of the 35 USC 112 rejection towards claim 6.

Applicants respectfully also note the rejection of claim 23 under 35 USC 112, second paragraph, as failing to meet the definiteness requirement. The Examiner notes that claim 23 recites a method limitation to an apparatus claim. The Applicants plan to file a divisional application towards the apparatus, and hence this claim is withdrawn.

Rejections under 35 USC §102

The Applicants respectfully traverse the rejection of claims 1-5, 9-14 and 23 under 35 USC §102(e), as being anticipated by U.S. Publication No. 2003/0154654, hereinafter "Goebel."

The Examiner has cited paragraph 0033 of Goebel, and cited that "air and fuel are combusted in combustor 36 and the reformat is passed via line 62 to the fuel processing reactor." The Examiner seems to consider the fuel-processing reactor of Goebel the equivalent of the reforming section of the current invention. In Goebel, the stream sent to the fuel is reformat – thus at least some amount of reforming must take place before the fuel processing (reforming) section. The current invention as recited in independent claim 1 does not involve any reforming before the feed stream is passed on to the reforming section, hence Goebel cannot anticipate claim 1 and the current invention.

Goebel focuses on "Direct water vaporization for fuel processor," which eliminates the need for large equipment like boilers to provide steam. Goebel involves directly spraying water into the combustion chamber to produce steam that is sent for fuel processing. The present invention does not envision such injection of water into the combustion chamber to produce steam. Steam is an optional component of the feed stream as described in paragraph 21. Thus the current method does not include steps of steam generation.

Secondly, Goebel does not describe partial combustion of the feed stream before the reforming section, as clearly brought out by currently amended claim 1. As described in claim 1 and paragraphs 22 and 23, "The combustion products comprise carbon dioxide, carbon monoxide, uncombusted hydrocarbon, steam, hydrogen and the inert components of air in the feed stream, such as, nitrogen" are sent to the reforming section. Clearly, the stream going to the reforming section has a fraction of uncombusted hydrocarbon, which is missing from Goebel. Goebel does not include any such steps. Referring to Fig. 1, Goebel simply sends the fuel stream 14 to reforming section 18, another fuel stream 38 directly evaporates water and forms steam that is sent to the reforming 18. Goebel is missing steps of partially combusting the feed stream before the reforming section.

Therefore, Applicants respectfully submit that Goebel does not teach or disclose all the elements of claim 1 and hence cannot anticipate the current invention. Applicants respectfully request that the Examiner withdraw the rejection under 35 USC 102 (e).

Rejections under 35 USC §103

The Examiner rejected claims 1-5, 6-9, 9-14 and 23 under 35 USC §103(a) as being unpatentable over Goebel. The Examiner further rejected claims 6-9 as being unpatentable over Goebel. The Examiner has rejected claim 7 under 35 USC §103(a) as being unpatentable over Goebel in view of Wagaman et al. (U.S. Patent no. 6,849,247, hereinafter Wagaman). The Applicants respectfully submit that the applied references do not teach, suggest, or disclose recitations of claim 1 and claims dependent therefrom.

As discussed in previous section, Goebel is missing features of present invention and hence cannot anticipate the claims. The Examiner argues that it would be obvious to carry out the combustion in combustor 36 of Goebel in a cyclical compression chamber, since Goebel discloses in paragraph 0033 that the fuel and oxygen in combustor 36 are ignited by energizing spark plugs. It is well known that such air and fuel mixtures are compressed before ignition, according to the principles of an internal combustion engine with a reciprocating piston. The Examiner seems to rely only on the "spark plug" as a common aspect. Though the current invention uses a spark plug for ignition, paragraph 16 clearly mentions, "Cyclical compression chamber 200 is also equipped with an ignition source 240, such as, for example, a spark plug." Thus a spark plug is simply one of the options for ignition.

The Examiner also seems to have taken a limited view of the current invention. In the Office Action, the Examiner mentioned, it would be obvious to from Wagaman et al to compress the air entering combustor 35 in the process of Goebel. The present invention is not providing separate streams of fuel and compressed air as hypothesized by the Examiner. The feed stream as defined in paragraph 12 is a mixture of air and oxygen and fuel. Moreover, the combustion process carried out in the current invention is quite different than Goebel or Wagaman, since this is only a partial combustion, producing uncombusted hydrocarbons. The uncombusted hydrocarbons further react in the reforming section to produce a gaseous composition comprising hydrogen.

Applicants respectfully submit that, neither Goebel nor Wagman, nor their hypothetical combination can anticipate or suggest features of the current invention. Applicant respectfully requests that the Examiner withdraw the rejection under 35 USC 103.

Summary

For the reasons set out above, Applicant respectfully submits that the application is in condition for allowance. Favorable reconsideration and allowance of the application are, therefore, respectfully requested.

If the Examiner believes that anything further is necessary to place the application in better condition for allowance, the Examiner is kindly asked to contact Applicant's undersigned representative at the telephone number below.

Respectfully submitted,

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